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REMARKSPending Claims

Claims 1-20 were presented for examination and are pending.

Claims 1-17 were allowed in the Office action from March 9, 2005. Claims 18-20 were rejected.

The applicant respectfully traverses the rejection and requests reconsideration in the light of the following remarks.

Claim Rejection 35 USC 103(a)

Claims 18-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Adair, Jr. U.S. Patent 5,659,303.

The applicant respectfully traverses the rejection.

The applicant respectfully submits that the amended claims claim fundamentally different invention from Adair and Kent alone or in combination and that Adair invention in no way makes the presently claimed invention obvious.

Claim 18 recites:

18. (previously presented) A frequency hopping telemetry transmitter comprising:  
circuit for transmitting transmissions intermittently, at time intervals and at various frequencies, independently of any receiver of said transmissions, and  
logic for providing a *predetermined frequency-time pattern* for controlling transmission frequency and time between transmissions, and  
wherein said transmitter is for modification of at least a portion of known data for transmission using a modifier that is varied based, at least in part, on said frequency-time pattern.

*(emphasis added)*

Claim 18 reflects the transmitter ability according to the present invention to operate in a one-way only system where transmitters communicate short intermittent messages over varied frequencies to a receiver without a benefit of a reverse communication link, e.g. they do not synchronize in any way with the receiver. Furthermore, the italicized text reflects the transmitter ability to control the frequency and time of transmission according to a predetermined frequency-time pattern and at the same time, the transmitter using modification of the transmitted data in accordance with the same pattern. As a result, a receiver for such transmissions can, for example, reverse such modifications. As described in the

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present invention, this has numerous advantages. For example, the transmitted data is different for each transmission even if the actual telemetry data is the same, which aids in preventing from spoofing the transmissions. Also, for example, the modifying can be done in such way that it does not add overhead to the transmission as the modification can be imposed on the telemetry data itself and such imposition can be reversed in the receiver since the receiver knows the frequency-time pattern and can easily synchronize and track the predetermined pattern. Consequently a receiver can anticipate modification of the data and subsequently reverse the modification.

The applicant respectfully submits that none of these is anticipated in any way by Adair nor is obvious in the light of Adair.

First: the second element of the claim requires "logic for providing a *predetermined frequency-time pattern* for controlling transmission frequency and time between transmissions". Adair teaches a system with plurality of transmitters designed with an intention to mitigate problem of collisions, which may occur if two or more transmitters transmit at the same time and at the same frequency. Adair transmitter design makes use of changing frequency according to a random number sequence. However, in Adair transmitter the actual sequence used for controlling the frequency is not predetermined.

Adair teaches:

The apparatus [i.e. transmitter] includes a memory containing a plurality of memory locations each containing a random number. A first counter produces a series of frequency pointers with each frequency pointer identifying one of the memory locations. An integrated memory controller is connected to receive the frequency pointers and from the first counter and retrieves random numbers from the locations identified by the frequency pointer. In response to the retrieved random numbers, the controller produces data sequences which are input to a digital control input of a voltage supply. The voltage supply produces voltages corresponding to the data sequences retrieved at the digital control input. A voltage controlled oscillator retrieves the supply voltage and produces radio frequency signals at frequencies corresponding to the supply voltages. [col. 2 lines 39-53]

To maintain the radiowave signals within maximum and minimum frequency limits, the apparatus further includes a limit memory containing limiting data corresponding to maximum and minimum frequency. The memory controller is connected to retrieve the limiting data and to prevent the voltage generator from producing supply voltages corresponding to frequencies greater than the maximum frequency or smaller than the minimum frequency. [col. 2 line 65 to col. 3 line 5]

While the output frequency  $f_{out}$  of each of the transmitters 46, 48, 50 may be varied, the frequency range over which the transmitters may transmit is limited between maximum frequency  $f_{max}$  and minimum frequency  $f_{min}$ . The maximum  $f_{max}$  frequency and the minimum frequency  $f_{min}$  may be established by operational parameters of the receiver 58 or by

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governmental regulation. The transmitters 46, 48, 50 must therefore limit their respective output frequencies fout to the allowed frequency range. [col. 4 lines 55-63]

In addition to varying from unit to unit, the data sequences corresponding to the minimum and maximum frequencies fmin, fmax vary according to temperature, as determined by the temperature-dependent electrical characteristics of the components. [col. 6, lines 21-24]

(emphasis added)

Thus, in Adair invention, the frequency sequence used by a transmitter is temperature dependent.

Adair describes producing the frequency sequences in great details on several columns (4, 5, 6, 7, 8, 9, and 10). For example, in conjunction with FIG. 3, Adair illustrates this point clearly by showing that there are several different limit values that are used according to the temperature.

Further, In Figure 5 and associated description Adair teaches steps of producing the frequency sequence. Accordingly the produced sequence depends on the frequency limits, which depend on the current temperature. For example, Adair teaches:

In step 510, after the controller 72 has retrieved the 6-bit random number, the controller 72 compares the random number to the 6-bit data sequences retrieved from the fine adjust table 84 in step 506. If, in step 512, the random number is within the limits specified by the data retrieved in step 506, the controller 72 provides the 6-bit random number to the voltage generator 70 in step 514...[col. 8 lines 57-63]

...if the random number not within the limits, the controller 72 returns to step 508, where it retrieves another random number from the random number table 109. [col. 9 lines 15-18]

(emphasis added)

Thus, it should be clear that Adair transmitter transmits at frequencies changed according to a sequence that is not predetermined. Note that this is in spite of the fact that the random numbers stored in the memory used for producing the sequence are predetermined (and not changing).

This means that regardless how the random numbers were generated in the first place, the frequency sequence is not predetermined.

Furthermore, in Adair transmitter, the frequency-time sequence is also dependent on the temperature and can not be anticipated by the receiver.

Adair teaches:

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In a method of transmitting operational data produced by a monitoring station from the monitoring station to a remotely located receiver, a plurality of random numbers are generated and stored in respective locations in a random number memory. A first pointer is produced to identify a first of the locations and a second pointer is produced to identify a second of the locations. A data sequence is retrieved from the location identified by the first pointer and a control voltage corresponding to the retrieved data sequence is generated in response to the data sequence. A data sequence is also retrieved from the location identified by the second pointer and a transmission interval is determined in response to the data sequence retrieved from the location identified by the second pointer. A transmitter generates a carrier signal having a frequency corresponding to the control voltage and the operational data is combined with the carrier signal to produce a radiowave signal which is then transmitted after the transmission interval. [col. 3, lines 18-37]

As can be seen in FIG. 6, the time pointer and frequency pointer do not necessarily remain equal, though they are initialized to the same value. Instead, the two pointers are allowed to drift apart. The drift between the frequency pointer and the time pointer occurs when the random number selected in step 508 is determined in step 512 to be outside of the allowed range. Then the random number designated by the frequency pointer is rejected, the frequency pointer is incremented, and a new random number is retrieved. Thus the frequency pointer may be increased at times when the time pointer is not, such that the frequency and time pointers drift apart. [col. 10, lines 9-20]

(emphasis added)

Thus, it should be clear that in Adair system, the receiver can not anticipate the temperature-dependent frequency-time sequence produced by the transmitter because the frequency-time sequence changes unpredictably depending on the temperature. Thus, the transmitter design and operation as taught by Adair would be quite unsuitable for providing the modification of transmission frequency and time between transmissions as well as modification of data as described with all its benefits. Consequently, the applicant respectfully submits that the present invention as described and claimed is not only non-obvious in the light of Adair, but that Adair invention is quite unsuitable for providing the benefits of the present invention even if the present disclosure is made available. Neither the benefits of the present invention nor implementation is in any way obvious in the light of Adair. Further, in the light of the above argument, the applicant respectfully submits that Adair, actually, elaborately teaches away from the present invention.

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Second: the third element of the claim requires "*modification of at least a portion of known data for transmission using a modifier that is varied based, at least in part, on said frequency-time pattern*".

The Office states:

Adair, Jr. does not explicitly teach the transmitter for modification of at least a portion of known data for transmission using a modifier as set forth in the application claim.

Referring to FIGS. 2 and 5, in column 9 lines 20-35, the controller 72 retrieves data from the random number table 109 according to a pointer system. That is, the controller 72 includes a frequency pointer counter 124 indicating an address in the random number table 109. The controller 72 also includes an interval pointer counter 126 to allow the controller 72 to independently select random numbers to generate random intervals between bursts. Further in column 10 lines 50-60, a voltage controlled oscillator 70 connected to receive said supply voltages controller 72, said voltage controlled oscillator producing said radiowave signals at radio frequencies corresponding to said supply voltages, said radio frequency signals being changed only between bursts, whereby each burst contains all of the data sought to be transmitted, and each set of data in each burst being fully transmitted without any radio frequency change. Since the voltage controlled oscillator producing said radiowave signals at radio frequencies corresponding to said supply voltages, one of ordinary skill in the art at the time the invention was made would have been recognized that the voltage controlled oscillator 70 performs equivalent function of the modifier as set forth in the application claim.

*(emphasis added)*

The Office admits that Adair does not explicitly teach the transmitter for modification of at least a portion of known data for transmission using a modifier as set forth in the application claim. The Office argues however that Adair transmitter modifies the transmission frequency, which makes it equivalent to modification of data.

The applicant respectfully submits that neither the text quoted by the Office nor any other portion of Adair invention teaches or makes in any way obvious what the present invention teaches. The applicant also respectfully submits that the variations of frequency and time intervals as described in the entire Adair disclosure and in particular as quoted by the Office is not an equivalent of modifying of data for transmission as required by the claim.

Adair teaches modification of transmitted frequency and time by a random temperature dependent pattern, however Adair does not teach modification of the data to be transmitted.

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For example, Adair clearly states:

In a method of transmitting operational data produced by a monitoring station from the monitoring station to a remotely located receiver, a plurality of random numbers are generated and stored in respective locations in random number memory. A first pointer is produced to identify a first of the locations and a second pointer is produced to identify a second of the locations. A data sequence is retrieved from the location identified by the first pointer and a control voltage corresponding to the retrieved data sequence is generated in response to the data sequence. A data sequence is also retrieved from the location identified by the second pointer and a transmission interval is determined in response to the data sequence retrieved from the location identified by the second pointer. A transmitter generates a carrier signal having a frequency corresponding to the control voltage and the operational data is combined with the carrier signal to produce a radiowave signal which is then transmitted after the transmission interval. [col. 3, lines 18-37]

Thus it should be clear that in Adair invention operational data is combined with the carrier whose frequency is changed according to a random number, retrieved from a memory location, however, Adair does not suggest in any way that the data sequence of random numbers is combined with or is used to modify the operation data itself.

Changing carrier frequency and modification of (operational) data for transmission are not the same or equivalent in any way. That they are not equivalent should be obvious at least from the fact that the present invention uses and benefits from both, i.e. varying two elements: (a) transmission frequency and time and (b) varying, separately and in addition, the transmitted data itself. Adair invention uses modification of only one, i.e., varying transmission frequency and time. This does not suggest in any way variation of the second and in particular variation of the second in combination with the first.

In the light of all the above arguments, it should be clear that the present invention is fundamentally different and that Adair invention does not teach or makes obvious in any way what the present invention teaches and claims.

Thus, the applicant respectfully submits that Adair does not teach or suggest in any way, or make obvious in any way what the present invention teaches and what claim 18 claims.

The applicant respectfully submits that, in the light of the above arguments, the Office rejection based on 35 U.S.C. 103(a) is traversed and that claim 18 is allowable. Because claims 19 to 20 depend on claim 18, they are too allowable.

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Additional Remarks

The Applicant wishes to inform the Office about the references received by the Applicant from the Office in conjunction with other applications pending in the Office:

**US Patent number: 6,072,784** issued June, 2006; Agrawal et al

**US Patent number: 6,760,317** issued May, 2004; Honkanen et al

**US Patent number: 5,914,981** issued June, 1999; Vicentimilla

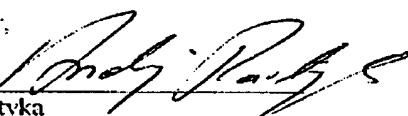
**US Patent number: 4,850,036** issued July, 1989; Smith

Request for Reconsideration Pursuant to 37 C.F.R. 1.111

Having responded to each and every ground for objection and rejection in the Office action mailed June 7, 2006, applicant requests reconsideration of the application pursuant to 37 CFR 1.111 and request that the Examiner allow the pending claims 18-20 in addition to the already allowed and pending claims 1-17 and pass the application to issue.

Applicant respectfully submits that claims 1-20 are allowable and requests that the Examiner pass the application to issue.

Respectfully,

By   
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